

The following information and guidance on HVAC system protection has been provided by BOMA International. Please review it and consider appropriate precautions.

In the wake of the September 11 attacks, the FBI issued an advisory to state and local law enforcement authorities and the public asking to remain especially alert to any unusual activities around ventilation systems. Please be advised this is a precautionary measure in keeping with the ongoing necessary heightened awareness for terrorism in the United States.

The FBI advisory specifically noted that while the Bureau possesses no specific threats at this time regarding the release of toxic chemicals into air handling systems, building owners and managers should be well-aware of the potential for contamination of air handling systems.

The following discussion piece was developed in based on information put forth by the "Terrorist Threat Advisory" distributed via the FBI's National Threat Warning System. Please be advised that while much of this is good logical advice, some of the recommendations put forth by the FBI might be extreme in some cases. For example, towards the end of this document, the FBI recommends that building and system managers should activate sprinklers if advised of an in-building release of hydrogen cyanide, chlorine or other toxic industrial chemicals. Logically, the water will mix with these chemicals to form less toxic substances, removing them from the air. However, one can not activate the sprinkler system without triggering the heating mechanism or physically break the fusible parts of sprinkler heads. Our research, at this point, indicates that securing outside air intakes and ensuring basic intruder prevention is the still the key to success. Realistically, there is no "air block" or other way to prevent someone from introducing foreign substances into an air intake once they get access to it. For basic reference, think of it as the main entrance to your building. If possible, restrict access to the air intake by ordinary lock and key and intruder alarms at night (for example, if it is in a courtyard or other semi-enclosed area). If the intake is on the street, perhaps a door could be built to shield it. It is likely that the risk for mischief is less during the day, but if the risk is judged to be significant, then you also might want to install a security camera or perhaps have the area guarded. Of course, for intakes located on the roof, it should be easier to restrict access and alarm the area.

Remember, anyone with information relating to a possibly emergency should immediately contact their local [FBI field office](#).

Please be assured that we at BOMA International will also be posting regular updates on this and other related issues on the [BOMA IAQ Resource Center](#) and the rest of the BOMA International website.

Summary

Release of a toxic chemical into an air handling system is a feasible; however, simple measures taken immediately on learning of the release might lessen harmful effects. Use of military and commercial chemical-biological detectors as "in-line" monitors is deemed unlikely to benefit because the response time is longer than the time needed for the toxic substance to be spread through the air handling system.

Key Findings

Most structures in the US have an air handling system (residences, office buildings, shopping centers, commercial establishments, transit systems, airports). Each system has

one or more air intakes and a blower or some similar device that moves the air through the system (typically, the ventilation system).

Release of a toxic chemical into an air handling system is a credible threat because (1) toxic chemicals are readily available in quantities and in forms making them easy to disperse into the air handling system, (2) most air intakes are readily accessible, (3) few air handling systems have any in-line filters that would be effective at removing these chemicals and (4) any release would be spread throughout the entire system within five minutes or less. Benefits will be derived from the simple measures of (1) turning off the air handling system (for an external release) or opening up the air handling system to full outside make-up air (for an internal release) and (2) moving occupants away from windows, elevators, courtyards, and stairwells and into interior rooms.

Adversary's Capabilities: Hydrogen Cyanide (HCN)

Intelligence assessments have focused attention to hydrogen cyanide as a potential chemical weapon for use against, in particular, air handling systems (that is, released within a building or other confined space or introduced into an air intake such that the hydrogen cyanide is spread throughout the building or space via the air handling system). Fueling such assessments are open-literature reports of improvised devices involving compounds intended to evolve hydrogen cyanide gas on mixing.

Hydrogen cyanide is a colorless liquid that rapidly evaporates under ordinary temperature and weather conditions. The hydrogen cyanide vapors (that is, a gas) have a faint almond odor; however, 20% of humans are incapable of detecting hydrogen cyanide at any concentration.

The toxicity of hydrogen cyanide is equivalent to that of chlorine but is significantly less than that of military chemical warfare agents. Hydrogen cyanide is less toxic by inhalation than by ingestion. The poisoning effects of hydrogen cyanide are not cumulative. An exposed person who survives can be expected to suffer no serious, long-term ill health effects from the hydrogen cyanide (by contrast, chlorine and many other toxic industrial chemicals often cause such long-term effects).

It is extremely difficult (some authorities report "impossible") to achieve a lethal concentration of hydrogen cyanide out-of-doors.

Preventions

Immediate, low- or no-cost measures:

- Building and system managers (for example, subway and tunnel systems) should be instructed to cut off the air handling system immediately upon being advised of the release of a toxic substance external to the building.
- This simple measure will stop the spread of the toxic substance throughout the building.
- Building and system managers should be instructed to place the air handling system on "full (or 100%) outside air" immediately upon being advised of the release of a toxic substance internal to the building. This simple measure will dilute the toxic substance already within the air handling system and will speed up its removal from the building.
- Building occupants should be instructed to seek "shelter in place" in areas where air movement is low. Occupants should be instructed to stay away from windows and to avoid places where air movement is brisk (for example: elevator shafts and stairwells). Occupants should be instructed to remain inside, under cover.
- Building and system managers should be advised that military and commercial detectors for toxic chemicals and biological pathogens are of little or no use as in-line monitors within an air handling system. The response time of currently available detectors is too slow to impact the spread of any toxic substance within the building or system. These Detectors might have value as a diagnostic tool post-exposure of the

building or system occupants and as a tool for determining when the outside air is safe for use following shut-off of external air intake.

- Building and system managers should activate the water sprinklers if advised of an in-building release of hydrogen cyanide, chlorine or other toxic industrial chemicals. The water will mix with these chemicals to form less toxic substances, removing them from the air.

Near term measure:

- Building and system managers should consider design and equipment modifications to make external air intakes less accessible. Options include installation of false or decoy intakes, camouflaging the actual intakes, and relocating the intakes to less accessible areas.